

# Patterns of engagement in leisure-time physical activities of workers with different economic status: a descriptive analysis

## *Padrões de envolvimento em atividades físicas de lazer em trabalhadores com diferentes situações econômicas: uma análise descritiva*

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**Abstract** – People with different economic levels may have peculiar characteristics with respect to patterns of engagement in leisure-time physical activity (LTPA). This information is crucial to improving public policies. The objective of this study was to describe the patterns of engagement (type, companionship, and setting) in LTPA by gender, according to income strata in workers. Cross-sectional study conducted from 2006 to 2008 in 23 of the 26 Brazilian states and the Federal District ( $n=46,981$ ). The sample consisted of workers who reported engaging in LTPA ( $n=25,479$ ). A standardized self-completion questionnaire was applied. The following variables were investigated: *type of LTPA* - sports, walking, cycling/running, fitness, and others; *companionship for LTPA* - alone, with a partner, or in a group; and *setting* - clubs/gyms, streets/parks, and others, according to monthly family income (low, middle and high). We analyzed frequency distribution and applied a 95% confidence interval. Prevalence and 95% confidence intervals were calculated. Sports was the activity most engaged in by low- (50.2%) and middle-income (42.3%) workers, while walking predominated in high-income individuals (31.0%). LTPA in groups was greater in low- (52.0%) and middle-income (50.4%) workers, and lower in their high-income counterparts (38%). Low- (47.0%) and middle-income (41.2%) workers used streets/parks more frequently, whereas high-income workers reported primarily using clubs/gyms (40.4%). It was concluded that low- and middle-income workers reported engaging in sports, in LTPA in groups, and using mainly public settings, while those with high-incomes engaged more in walking, in LTPA in groups or alone, and used more private settings.

**Key words:** Adults; Brazil; Physical activity; Socioeconomic status.

**Resumo** – Pessoas com diferentes níveis econômicos podem ter características peculiares relacionadas a padrões de envolvimento em atividades físicas no tempo de lazer (AFL). Tais informações são cruciais para melhorar políticas públicas. O objetivo do estudo foi descrever padrões de engajamento (tipo, companhia, e espaço para a prática) em AFL geral e por gênero, segundo os estratos de renda em trabalhadores. Estudo transversal realizado de 2006 a 2008 em 23 dos 26 estados brasileiros e o Distrito Federal ( $n=46.981$ ). Neste estudo foram analisados trabalhadores que praticavam AFL ( $n=25.479$ ). Aplicou-se um questionário padronizado. As variáveis investigadas foram tipo de AFL - esportes, caminhada, ciclismo/corrída, fitness, e outras; companhia para prática de AFL - sozinho, com parceiro, e em grupo; e local de prática - clubes/academias, ruas/parques, e outros, por renda familiar mensal (baixa, média e alta). Prevalências e intervalos de confiança de 95% foram calculados. Esporte foi a atividade mais reportada por trabalhadores com renda baixa (50,2%) e média (42,3%), e a caminhada (31,0%) foi predominante naqueles de alta renda. AFL em grupo foi maior nos trabalhadores com baixa (52,0%) e média renda (50,4%), e menor naqueles com elevada renda (38,0%). Trabalhadores de baixa (47,0%) e média (41,2%) renda usavam mais ruas/parques, enquanto os de renda alta usavam mais clubes/academias (40,4%). Pode concluir que os trabalhadores com renda baixa e média reportaram engajar mais em esportes, em AFL em grupos, e usar mais locais públicos, enquanto os de maior renda engajavam mais em caminhada, faziam atividades em grupo ou sozinhos e usavam mais locais privados.

**Palavras-chave:** Adultos; Atividade física; Brasil; Status econômico.

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## INTRODUCTION

Economic context has a strong influence on the type, magnitude, and distribution of health problems in societies. Behavior that involves seemingly individual choices such as smoking, alcohol consumption, and physical activity are markedly influenced by opportunities that depend on cultural, environmental, and economic issues<sup>1</sup>. Studies have found that belonging to vulnerable social and minority groups affects involvement in leisure-time physical activity (LTPA). These individuals are generally considered to lack money and time, in addition to having restricted access to safe environments, and fewer support networks for physical activity<sup>2-4</sup>. These conditions result in important differences regarding involvement in LTPA and its associated health benefits<sup>5</sup>.

Physical inactivity is the world's fourth most common cause of death<sup>6</sup>. Recently published data indicate that 31.1% of adults worldwide are physically inactive<sup>7</sup>. Among Brazilian adults, the range of physical inactivity varies among the state capitals (11.3% to 22.4%), with a mean frequency of 14.9%<sup>8</sup>. It is important to highlight that physical inactivity is more common in high-income than in low-income countries<sup>7</sup>. Evidence has demonstrated that socioeconomic markers exhibit independent and positive relationships with LTPA in Brazil. These include family income<sup>9</sup>, salary<sup>10</sup>, occupation<sup>11</sup>, social class<sup>12</sup>, and schooling<sup>8,13,14</sup>. In addition to the association with LTPA levels, socioeconomic condition may also interfere with the type of activity, companionship, and environments associated with LTPA<sup>5</sup>. Data from a number of countries<sup>15-17</sup> help sustain this hypothesis; however, they remain scarce in low- and middle-income nations. To the best of our knowledge, there are two other studies in Brazil that investigate LTPA patterns (specifically type of activity) in adults<sup>9,11</sup>.

Although Brazil is considered a transitional middle-income country, it exhibits wide economic disparities and a considerable number of cities have low Human Development Index measures (HDI<0.699)<sup>18</sup>. This large economic inequality can result in completely different LTPA patterns among different economic strata. Exploring peculiar characteristics related to the physical activity patterns of individuals from different economic strata is crucial to improving public policies for the development of appropriate settings and effective physical activity programs, in order to create opportunities and expand possibilities for participating in LTPA. Thus, the aim of this study was to describe LTPA patterns (type, companionship, and setting) by gender, according to income strata in Brazilian industrial workers.

## METHODS

### Sample selection

The data were part of a survey entitled "Lifestyle and Leisure Habits of Industrial Workers", conducted from 2006 to 2008 among industrial workers from 23 of the 26 Brazilian states and the Federal District. The states of Rio

de Janeiro, Piauí, and Sergipe were not included in this analysis because data were not collected in a timely manner. Brazilian industrial companies operate primarily in sectors related to industrial mining, industrial processing, industrial service for public utilities, and construction<sup>19</sup>. At that time, individuals in these companies accounted for 24% of all documented workers in the country, that is, approximately 8.5 million people<sup>20</sup>.

Sample sizes were calculated separately for each federal unit, using the target population and the following parameters: prevalence of 45% of leisure-time physical inactivity, obtained from an earlier study involving industrial workers<sup>21</sup>, with a sampling error of three percentage points, and 95% confidence interval (95%CI). The minimum sample size was then increased by 50% due to the design effect. Finally, sample size was expanded by a further 20% to account for possible missing data and refusals. The total sum of each federal unit sampled resulted in 52,774 workers.

The sampling plan was also executed separately in each federal unit. First, workers were stratified according to company size (number of employees): small (20 to 99), medium (100 to 499), and large (500 or more). Next, the number of workers needed in each company size was determined, maintaining the proportion observed in the reference population. The second step was to stratify the number of workers needed in each company size stratum according to the geographic regions of the federal unit and the proportion found in the reference population. Companies were then randomly selected. In each geographic region, between 10 and 50% from each size stratum were selected, according to the number of existing companies and number of workers needed for the sample. Companies that did not allow their employees to participate were replaced by other similar sized companies engaged in the same activity in the same geographic region. Finally, workers from the final sample were systematically selected using employee lists provided by the companies.

## Measures

The same self-completion questionnaire was used to collect worker data. Instrument content and validation were carried out by two senior researchers. A pilot test was also performed to evaluate clarity as well as detect and resolve any problems. With respect to reliability, Kappa and intraclass correlation coefficients ranged from 0.40 to 0.79 (moderate to strong agreement).

Data collection procedures were also standardized among the 24 federal units. The interviewers underwent training and received a procedure manual regarding questionnaire application. The questionnaire was administered in groups of three to 15 workers, always with two interviewers. Before the questionnaires were distributed, workers were informed that their participation was voluntary and their responses were confidential. Participants were instructed not to write their names on the questionnaires. The data were digitized through optical reading of the questionnaires using Sphynx software (Sphynx Software Solutions Incorporation, Washington, USA).

For this study, workers were stratified according to their monthly family income (number of minimum monthly wages earned by the employee's family), with response options in categories (in US dollars): low ( $\leq$ US\$280), middle (US\$281 - US\$1,400), and high ( $\geq$ US\$1,401). At the time of data collection, the first category ( $\leq$  \$ 280) corresponded to two minimum monthly wages and other categories corresponded to 3-10, and  $\geq$ 11 minimum wages, respectively.

The following variables were investigated: 1) *type of LTPA* [sports, walking, cycling/running, fitness (e.g., gymnastics, resistance exercise, dancing, and swimming), and others (e.g., yoga, tai chi, and martial arts)]; 2) *companionship for LTPA* (alone, with partner, and in a group); and 3) *setting* (clubs/gyms, streets/parks, and others).

## Analysis

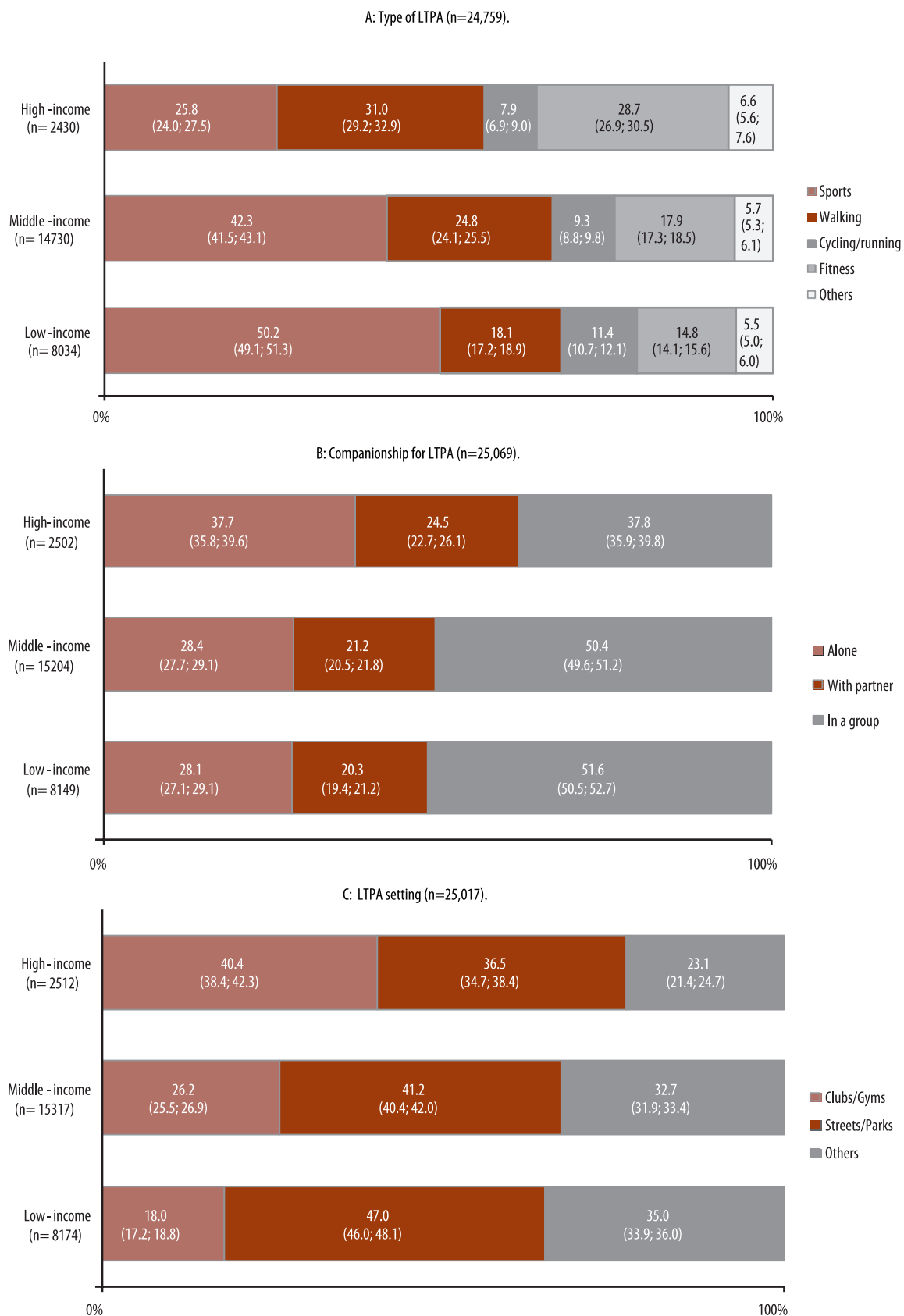
Statistical analyses were performed using the Statistical Package for the Social Sciences<sup>®</sup> (SPSS) for Microsoft<sup>®</sup> Windows<sup>™</sup>, version 15.0 (SPSS Incorporation, USA). The data were described by gender using absolute and relative frequencies and their respective 95%CI for LTPA patterns in each economic stratum.

The Human Research Ethics Committee of the Federal University of Santa Catarina (technical report numbers 306/05 and 099/2007) approved the project and the Industrial Social Services (SESI) authorized the use of the data for this study. All participants agreed to take part in the research.

## RESULTS

The average questionnaire response rate was 90.6% (SD=8.6), corresponding to 47,886 workers. A total of 409 workers did not reveal their gender, 496 did not report family income, and 309 did not answer the question on LTPA, resulting in 46,672 workers. To describe LTPA patterns, we considered only workers who reported engaging in LTPA at least once a week (58.1%;  $n=25,479$ ). The response rate was 97.2% ( $n=24,759$ ) for type of activity, 98.4% ( $n=25,069$ ) for companionship during the activity, and 98.2% ( $n=25,017$ ) for setting. A total of 78.3% of those who engaged in LTPA were male, 49.8% were younger than 30 years old, and 52.2% were high school graduates.

Engaging in sports activities was higher among low- (50.5%; 95%CI: 49.1; 51.3) and middle-income (42.7%; 95%CI: 41.5; 43.1) workers. Walking was the activity most reported by high-income earners (31.1%; 95%CI: 29.2; 32.9) (Figure 1A). LTPA in groups was more common in low- (51.6%; 95%CI: 50.5; 52.7) and middle-income (50.4%; 95%CI: 49.6; 51.2) workers. Among high-income individuals, we observed similar LTPA rates in groups (37.8%; 95%CI: 35.9; 39.8) and alone (37.7%; 95%CI: 35.8; 39.6) (Figure 1B). LTPA in streets/parks was most common among low- (47.0%; 95%CI: 46.0; 48.1) and middle-income (41.2%; 95%CI: 40.4; 42.0) workers, whereas the use of clubs/gyms was more frequent among those with high incomes (40.4%; 95%CI: 38.4; 42.3) (Figure 1C).



**Figure 1.** Type, companionship, and setting for leisure-time physical activity (LTPA) reported by industrial workers in Brazil, according to monthly family income. 2006-2008. Unadjusted proportions and 95% confidence intervals.

In regard to gender, males engaged more in sports, mainly those with low- (59.8%; 95%CI: 58.6; 61.0) and middle-incomes (51.8%; 95%CI: 50.9; 52.7), while females with low- (43.9%; 95%CI: 41.4; 46.4) and middle-income (43.2%; 95%CI: 41.5; 44.9) engaged more in walking, and those with high-income engaged more in fitness (47.5%; 95%CI: 43.7; 51.5). Males reported more LTPA in groups, mostly low- (56.2%; 95%CI: 54.9; 57.3) and middle-income workers (54.7%; 95%CI: 53.8; 55.6). Females engaged in LTPA alone (low-: 38.0%; 95%CI: 35.6; 40.3, middle-: 33.6%; 95%CI: 32.1; 35.2; high-income: 36.3%; 95%CI: 32.7; 39.9) or in a group (low-: 33.7%; 95%CI: 31.4; 35.9, middle-: 36.2%; 95%CI: 34.6; 37.8; high-income: 34.2%; 95%CI: 30.6; 37.8). We found an increase in the use of clubs/gyms with a rise in income in both genders. However, the settings most used for LTPA were streets/parks in males and females with low- (46.7% and 48.3%, respectively) and middle-incomes (41.1% and 41.6%, respectively) (Table 1).

**Table 1.** Type, companionship, and setting for leisure-time physical activity (LTPA) reported by males and females, according to monthly family income. 2006-2008.

LTPA	Low-income		Middle-income		High-income	
	Male	Female	Male	Female	Male	Female
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
<b>Type</b>						
Sports	59.8 (58.6; 61.0)	10.2 (8.7; 11.7)	51.8 (50.9; 52.7)	9.2 (8.2; 10.2)	33.3 (31.1; 35.5)	5.0 (3.3; 6.6)
Walking	11.9 (11.1; 12.7)	43.9 (41.4; 46.4)	19.5 (18.7; 20.2)	43.2 (41.5; 44.9)	29.2 (27.1; 31.4)	36.0 (32.3; 39.7)
Cycling/running	12.0 (11.2; 12.8)	9.0 (7.5; 10.4)	10.3 (9.8; 10.9)	5.7 (4.9; 6.5)	8.8 (7.5; 10.1)	5.6 (3.8; 7.4)
Fitness	10.7 (10.0; 11.5)	31.7 (29.4; 34.1)	12.6 (12.0; 13.2)	36.6 (34.9; 38.2)	21.8 (19.9; 23.8)	47.5 (43.7; 51.5)
Others	5.6 (5.0; 6.1)	5.2 (4.1; 6.3)	5.8 (5.4; 6.2)	5.3 (4.5; 6.1)	6.9 (5.7; 8.0)	5.9 (4.1; 7.7)
<b>Companionship</b>						
Alone	25.6 (24.6; 26.7)	38.0 (35.6; 40.3)	26.9 (26.1; 27.7)	33.6 (32.1; 35.2)	38.3 (36.0; 40.5)	36.3 (32.7; 39.9)
With partner	18.2 (17.3; 19.2)	28.3 (26.2; 30.5)	18.5 (17.7; 19.2)	30.2 (28.7; 31.7)	22.6 (20.6; 24.5)	29.5 (26.0; 32.9)
In a group	56.2 (54.9; 57.3)	33.7 (31.4; 35.9)	54.7 (53.8; 55.6)	36.2 (34.6; 37.8)	39.1 (36.9; 41.4)	34.2 (30.6; 37.8)
<b>Setting</b>						
Clubs/Gyms	17.4 (16.4; 18.3)	20.6 (18.6; 22.5)	24.6 (23.8; 25.4)	31.3 (29.8; 32.8)	38.1 (35.8; 40.3)	46.5 (42.8; 50.3)
Streets/Parks	46.7 (45.5; 47.9)	48.3 (45.9; 50.7)	41.1 (40.2; 41.9)	41.6 (40.0; 43.2)	37.6 (35.4; 39.9)	33.6 (30.1; 37.2)
Others	35.9 (34.8; 37.1)	31.1 (28.8; 33.3)	34.3 (33.5; 35.2)	27.1 (25.6; 28.6)	24.3 (22.3; 26.3)	19.8 (16.8; 22.8)

Unadjusted proportions and 95% confidence intervals.

## DISCUSSION

This study aimed to identify LTPA patterns according to the economic status of industrial workers in 24 of the 27 federal units in Brazil. Our study showed that LTPA pattern differs according to economic status, and sometimes between men



and women within each stratum. While workers with high-income levels do more walking and fitness exercises, they engage equally in LTPA alone or in groups and use more private settings. Low- and middle-income workers engage primarily in physical activities, in groups and in public settings.

To the best of our knowledge, only one other study with Brazilian adults observed the relationship between LTPA patterns (not only LTPA levels) and socioeconomic status. Research conducted in 2001 and 2002 with 2,050 adults from the four regions of Sao Paulo state obtained similar results, suggesting that the prevalence of activities such as walking, fitness, and resistance exercise is directly associated with schooling level (a *proxy* for socioeconomic status)<sup>11</sup>. Similar results were observed in Peru, where engaging more in group sports was associated with lower income levels<sup>15</sup>. A study conducted in Perth, Australia, found that the prevalence of leisure walking was 20% lower in people living in low socioeconomic level areas. These individuals were also less likely to use open spaces, such as beaches and tennis courts (60.0%), sports centers, and gymnasiums or fitness clubs (40%) than those from higher socioeconomic level areas<sup>16</sup>. A possible explanation for these differences is that in wealthier areas, residents have access to individual sports facilities and cleaner neighborhoods, face fewer physical barriers to walking, and less crime and traffic. However, they have less access to open public spaces and facilities designed for group sports<sup>22</sup>. Researchers<sup>17</sup> observed a similar phenomenon in Adelaide, Australia, where there was greater prevalence of leisure walking in areas with higher socioeconomic levels; this phenomenon is associated with the fact that adults from these strata face significantly fewer barriers to regularly engaging in this activity. Some of our results are consistent with this pattern. On the other hand, in Brazil, open public settings for group sports are usually found in low socioeconomic areas and are sometimes the only sites available for LTPA<sup>23</sup>. Other researchers have observed that group sports settings are associated with more LTPA in adults with low educational levels<sup>24</sup>.

Distinct preferences for LTPA according to gender were confirmed in this study. Men, especially those with low and middle incomes, engaged more frequently in sports activities. By contrast, the predominant physical activity among women was walking or fitness exercises. These gender differences can be explained by the tendency towards more intense physical activity by men during their free time<sup>2</sup>. Two studies with Brazilian adults showed similar results. Monteiro et al.<sup>9</sup> analyzed data from the Brazilian Living Standards Measurement Survey, conducted in 1996 and 1997 with 11,033 adults in the Southeast and Northeast of the country. Results demonstrated that walking/jogging were the most engaged in activities among women. On the other hand, collective sports (football, basketball or volleyball) were the most frequent LTPA in men. However, the authors did not consider economic strata or other socioeconomic *proxies* in their analyses. Zanchetta et al.<sup>11</sup> evaluated type of LTPA according to gender and educational level and found that the prevalence of fitness activities

and walking in women was positively associated with educational level (different from our results). However, soccer was the most prevalent LTPA men with low and intermediate educational levels, while those with higher levels shared this preference with walking and fitness exercises.

Engaging in LTPA alone or in groups was common in women of all strata, while in men group activities were most frequent in the low- and middle-income strata. This likely occurs because of the types of activity normally chosen by each gender in each stratum. With respect to LTPA settings, men and women with higher incomes reported using clubs and gyms more frequently. By contrast, the choice of parks and streets was common among individuals from all strata but more frequent in the lower stratum, especially in men. Given that engaging in LTPA is commonly associated with financial investments, and that lack of money is the main barrier to using private facilities<sup>4</sup>, it is plausible to conclude that economically advantaged workers use them more frequently.

A question that arises is whether individuals with lower income levels exhibit these LTPA patterns because they prefer to do so or because they are restricted to such activities that are available to them. In addition, there are questions about the predominance of activities performed alone among those in the highest income stratum. Differences in LTPA patterns among income strata could be partially explained by the distribution of environmental opportunities<sup>25</sup>. Income level influences the possibilities and opportunities for an active lifestyle and the likelihood of availability and accessibility to LTPA infrastructure (parks, sports centers, public spaces, gyms etc.) and social support<sup>1,5,16</sup>, leading to unequal LTPA opportunities.

We believe that information about LTPA patterns (type of activity, companionship, and setting) can increase the effectiveness of programs that promote active lifestyles, particularly in communities and companies. Brazil currently has policies that encourage physical activity, such as the National Health Promotion Policy (PNPS) and the National Plan for Physical Activity (PNAF). These focus on strategies that ensure adequate settings for physical activity and promote motivational campaigns and community intervention programs<sup>26</sup>. For example, in 2011 the Brazilian Ministry of Health established the Health Academy Program to stimulate the creation of spaces and qualify professionals to work with health promotion and physical activity in communities. To that end, several fitness centers with multi-purpose equipment, professional support and guidance regarding physical activities, leisure, and healthy lifestyles are being built in areas covered by Basic Health Units<sup>27-28</sup>. Previous knowledge about LTPA patterns could help improve this program's likelihood of success, by adapting activities to community needs and preferences and helping reduce inequalities in LTPA opportunities caused by income differences.

Some study limitations must be acknowledged. First, since income information was collected and analyzed in income ranges, it is important to carefully consider the description of groups as low-, medium- and high-income. In addition, it was not possible to consider the number of



individuals dependent on each family income. Moreover, workers were not questioned about the reasons for reporting their LTPA patterns. Finally, data from this study were derived from a representative sample of Brazilian workers. Generalizations of the results must therefore consider this aspect. On the other hand, descriptive data on LTPA patterns (*i.e.*, type, companionship, and setting) are scarce in Brazil, especially those stratified by income.

## CONCLUSION

The LTPA patterns observed in this study differ across income levels, as well as between men and women within and between strata. Workers with low- and middle-income levels engage more in group sports in public settings, whereas those with higher incomes reported more walking, both alone and in groups, and the use of private settings. In relation to gender, we found that LTPA patterns were different in men and women with higher incomes (type of activity: sports, walking and fitness; setting: public and private) compared to their low and middle-income counterparts (type of activity: sports for men and walking for women; setting: more public settings for both genders).

These results suggest that the creation of multiuse public settings (sports courts, sidewalks, jogging and cycling paths, multisport facilities etc.) to engage in physical activity can be effective for both groups. Companionship may be associated to the type of activity, since many sports are performed in groups, while walking can be done alone or in groups. Future research in this field should consider socioeconomic strata. These studies could also investigate whether people engage in certain activities at specific places because they prefer them or because they have no other options. A question that arises is whether there is a mismatch between opportunities available and settings where people want to be active. Such studies will help develop physical activity policies that reduce these inequalities in transitional countries.

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